

PATENT COOPERATION TREATY

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REC'D 30 JUN 2005

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference -	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/NO2004/000110	International filing date (day/month/year) 22.04.2004	Priority date (day/month/year) 24.04.2003
International Patent Classification (IPC) or national classification and IPC E02F 3/88		
Applicant Fossura AS et al		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
 - a. ☒ (sent to the applicant and to the International Bureau) a total of 2 sheets, as follows:
 - ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

Date of submission of the demand 29.10.2004	Date of completion of this report 23.06.2005
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88	Authorized officer Lars Björk / MRO Telephone No. +46 8 782 25 00

Form PCT/IPEA/409 (cover sheet) (January 2004)

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/NO2004/000110

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of:

- ☐ international search (under Rules 12.3 and 23.1(b))
☐ publication of the international application (under Rule 12.4)
☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☐ the international application as originally filed/furnished

☒ the description:

pages 1 - 5 as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☒ the claims:

pages _____ as originally filed/furnished

pages* _____ as amended (together with any statement) under Article 19

pages* 1 - 2 received by this Authority on 04.03.2005

pages* _____ received by this Authority on _____

☒ the drawings:

pages 1 - 3 as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/figs _____
☐ the sequence listing (*specify*): _____
☐ any table(s) related to the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/figs _____
☐ the sequence listing (*specify*): _____
☐ any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/NO2004/000110

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1-13</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-13</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-13</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

The following documents were cited in the International Search Report:

D1: US 6145223 A
D2: WO 0132503 A2
D3: WO 0175235 A1
D4: US 4750279 A

D1 discloses a dredging apparatus for the removal of cuttings at the seabed around bore holes. The apparatus has an ejector coupled to a suction hose and a conveyor pipe, respectively, for moving the cuttings to another place on the seabed. The dredging apparatus comprises a drive motor, a pumping device and an ejector. The drive motor is adapted to drive the pumping device which, in turn, is adapted to deliver a forced flow of water to the ejector in order to establish and maintain the ejecting effect. The ejector, pumping device and drive motor are assembled to form a unit. A cable delivers energy to the motor from the surface.

D2 discloses a method for moving underwater rocks and sediments, also at significant depths, e.g. in connection with the removal of protective rocks around underwater installations where maintenance is to be conducted, by which equipment comprising a tubing with an ejector nozzle is arranged completely externally in relation to the tubing on a standard, remote controlled submarine (ROV). The invention also relates to a device to conduct the method.

.../...

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Box V

D3 discloses a method and device for moving underwater rocks and sediments, also at significant depths, e.g. in connection with the removal of protective rocks around underwater installations, where maintenance is to be conducted. The device comprises rigid or at least partly flexible tubing thorough which the masses may be transported with the aid of a pressure gradient produced by an ejector nozzle arranged externally in relation to said tubing. The nozzle is fed with water from a water pump. The device further comprises a chassis adapted to be transported along the (sea) bottom. The required power is arranged to be supplied through a cable from the surface, while the tubing preferably is arranged to be remotely controlled by a manipulator.

D4 represents background art.

The amended claims filed with the letter of 04-03-2005 differ from the cited documents in that couplings between the power unit and the ejectors on the sea bed make it easy to connect and disconnect the power unit and the ejectors to or from each other.

No relevant combination of the documents would lead a person skilled in the art to the invention defined in the amended claims filed with the letter of 04-03-2005.

According to the argument stated above, the invention claimed in the amended claims 1-13, is novel, considered to involve an inventive step and to have industrial applicability.

Claims

- 5 1. Device for removal of cuttings from a borehole (7) with the use of an ejector, **characterized in** that the device comprises a first unit (1) in the form of an ROV (2) with a rigidly attached ejector pump (3) provided with a connecting hose (4) terminated with a first part (11a) of a coupling (11), and at least a second unit comprising a suction hose (6) and an ejector (5), said ejector (5) being provided with a second part (11b) of said coupling (11), said first part (11a) and said second part
- 10 (11b) of said coupling (11) being adapted to be connected to one another.
2. Device as claimed in claims 1, **characterized in** that the suction hose's (6) inlet end is arranged to be connected to a guide base at a borehole (7) opening with an adapted coupling (12).
3. Device as claimed in any one of claims 1-2, **characterized in** that the ejector pump (3) supplying the ejector (5) with water, is powered by the standard power supply for the ROV (2).
- 15 4. Device as claimed in any one of claims 1-3, **characterized in** that the ejector (5) is arranged at the outlet end of the suction hose (6).
5. Device as claimed in any one of claims 1-4, **characterized in** that a discharge hose or pipe (14) is connected to the outlet side of the ejector (5) so that the sediment can be transported further away from the borehole (7).
- 20 6. Device as claimed in any one of claims 1-3 or claim 5, **characterized in** that the ejector (5) is connected directly to a guide base around a borehole (7) with a suitable coupling (12) while the outlet side of the ejector is connected to a discharge hose (14), said ROV preferably being connected to the ejector (5) by means of a particular extension hose (18).
7. Device as claimed in any one of the preceding claims, **characterized in** that the ejector (5) is of
- 25 a type having an ejector nozzle arranged completely external of the boring of the ejector tube.
8. Device as claimed in any one of the preceding claims, **characterized in** that, at the inlet end of the suction hose (6) a pipe or suction head with two inlet openings are arranged at a vertical distance from one another, the upper one thus arranged to suck in only water while the lower one is arranged to suck in a combination of sediment and water.
- 30 9. Device as claimed in any one of claims 1-5 or 7-8, **characterized in** that the suction hose (6) and the ejector (5) has a common, substantially constant cross section.
10. Device as claimed in any one of the preceding claims, **characterized in** that the ejector (5) is a straight shaped ejector with two or more symmetrically arranged nozzles.

11. Device as claimed in any one of the preceding claims, **characterized in** that the outlet end (10) of the ejector (5) is shaped with a gradually increasing cross section.
12. Device as claimed in any one of the preceding claims, **characterized in** that the coupling (11) between the water pump (3) and the ejector (5) is chosen among existing rapid couplings.
- 5 13. Device as claimed in any one of the preceding claims, **characterized in** that at least one nozzle, arranged for being supplied with water by the pump (3), is arranged near the inlet end of the suction hose (6) to allow back-flush of water through the suction hose (6) to flush out any sediment that incidentally get stuck at said inlet end.